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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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2817

DATE MAILED: 07/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/657,944

Applicant(s)

NAKAMURA ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6,8 and 11-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,12,16,17 and 21-31 is/are rejected.
- 7) ☒ Claim(s) 8,11,13-15 and 18-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "capacitor" that "includes a wire..." as recited in claim 6, and the "one capacitor" as recited in claim 1 in conjunction with the "third resonator" as recited in claim 23, must be shown or the feature(s) canceled from the claim(s) (see also the § 112 rejection below). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 8, 20, 22, 27 & 29 are objected to because of the following informalities:

In claim 8, on line 3, note that - - the - - should be inserted before "output".

Additionally, perhaps "input terminal" and "output terminal" should be - - first terminal - - and - - second terminal - -, respectively (see claim 1, lines 3-4 and Fig. 12a where the first/ second terminals are black circles and the input/output terminals are white circles).

In claim 20, on line 2, note that "reactance element" lacks antecedent basis and should be changed to - - capacitor - - (see claim 1 also Figs. 17a-c which show forming a capacitor 2012 using the electrodes of bulk acoustic wave resonators).

In claim 22, on lines 1-2, note that "said one end..." lacks antecedent basis and should be changed to - - said grounding point end - - (see claim 1, lines 7-10).

Claims 27 and 29 are objected to as not being further limiting because they respectively recite that the filter has "passing characteristics that incline toward a higher" or a "lower frequency portion of the pass-band", but band elimination filters by definition inherently have an elimination band with an incline (i.e. a slant, slope or deviation from horizontal and vertical as defined in Webster's II New Riverside University Dictionary) toward the lower frequency side and an incline toward the higher frequency side, for example, the inclines on both sides of the lowest point of the passing characteristic in Applicants' Fig. 1(b). Hence, it is unclear what added structure is recited by the claims. Appropriate correction is required.

New Grounds of Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 6 and 23 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 6 as amended recites the "capacitor includes a wire used in wire mounting". However, there appears to be no support in the original specification for a wire used in mounting providing a "capacitor". It should be noted that the specification discloses a mounting wire providing an inductor (see e.g. page 6, lines 9-12), and it is known in the art that bonding wires inherently provide an inductance. There appears to be no discussion in the original specification or illustration in the figures of how a bonding wire is able to provide a "capacitor". Additionally, there is no discussion or figure in the original specification of an embodiment having both "one capacitor" between the input/output terminals (claim 1) and also a "third acoustic resonator" between the input/output terminals (claim 23). Rather the original specification was to a reactance element between the input/output terminals that can be a capacitor or an acoustic resonator (see e.g. the 7th and 23rd aspects of the invention on pages 7 and 9).

Consequently, it appears Applicants have amended the claims by inserting subject matter which can be construed as new matter. However, if Applicants disagree, then Applicants are required to provide an explanation as to why these features should

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not be considered "new matter", as well as providing the location(s) in the original specification where there is support for the subject matter in question.

5. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites "said normalized impedance" on lines 1-2 thereof. There is insufficient antecedent basis for this limitation in the claim, and "normalized impedance" is unclear because it has not been defined in the claim (see the definition subject matter of canceled claim 3, which should be added to claim 4, but replace "reactance element" with - - capacitor - -).

Claim 6 recites the "capacitor includes a wire used in wire mounting" wherein it is totally unclear how a wire with an inherent inductance can provide a "capacitor".

Clarification is required.

New Grounds of Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 28, 29 and 31 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hosaka et al. JP 7-263995 (of record/cited by Applicants).

Figs. 1, 2 and 4 of Hosaka et al. disclose a band elimination filter eliminating band R as shown in Fig. 4 (see sections [0006], [0007] and [0017] of the attached machine translation) comprising: an input terminal and an output terminal 9 (Fig. 1); one inductor (i.e. the rightmost inductor 4) is connected between a first terminal being the leftmost terminal of the leftmost surface acoustic wave (SAW) resonator 1 (Fig. 1) and a second terminal being the rightmost terminal of the rightmost SAW resonator 1, the first terminal is connected to the input terminal via the left most inductor 4 and two wires 8, and the second terminal is connected to the output terminal via a wire 8; wherein the first terminal is grounded via only a first grounding point via the leftmost/first SAW resonator and a wire (not numbered by shown in Fig. 1) connecting the rightmost terminal of the first SAW resonator to ground, and the second terminal is grounded via only a second grounding point via the rightmost/second SAW resonator and a wire connecting the leftmost terminal of the second SAW resonator to ground.

Regarding claim 29, as can be seen in Fig. 4 the passing characteristics have an incline on the left of the elimination band R toward a lower frequency portion of the pass-band.

Regarding claim 31, the wires connecting the terminals of the SAW resonators to ground inherently provide parasitic inductors the same as Applicants' invention (see e.g. the specification at page 23, the first full paragraph thereof discussing Fig. 5a).

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9. Claims 1, 2, 12, 16, 17, 21, 22, 24, 26 and 27 are rejected under 35 U.S.C. § 102(b) as being anticipated by Hikita et al. U.S. 4,803,449.

Figs. 4, 7 and 8 of Hikita et al. disclose a band elimination filter eliminating the band of frequencies from 825 to 845 MHz (see Fig. 8 and col. 6, lines 45-48) comprising: an input terminal 11/110 (Figs. 4/7) and output terminal 12/120; one capacitor (e.g. 431/70 in Figs. 4/7)[note: "one capacitor" does not require "only" one capacitor especially when used with open claim language "comprising"] between a first terminal IN (Fig. 4) connected to the input terminal via matching circuit inductors 13,14 and a second terminal OUT connected to the output terminal via matching inductors 15,16; wherein the first terminal IN is grounded only via a first grounding point by a first acoustic resonator 422 connected therebetween, and the second terminal OUT is grounded via only a second grounding point by a second acoustic resonator 424 connected therebetween.

Regarding claims 2, 12, 16, 17 and 22, the acoustic resonators are SAW resonators considered "piezoelectric resonators" because they are formed on a piezoelectric substrate 10 (Fig. 4) that supports the resonating acoustic wave, and the capacitor 431 is formed on the piezoelectric substrate by electrodes P2 and P3, and the first and second resonators 422 and 424 have separate ground electrodes P4 and P8 on the piezoelectric substrate and are independently grounded by wiring on the substrate shown in Fig. 4 as the wiring lines from P4 and P8 to off chip ground. Regarding claim 21, the first and second resonators have different resonant frequencies (see col. 6, lines 60-66). Regarding claim 27, see Fig. 8 that shows the rejection band

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having an "incline" toward a higher frequency portion of a pass-band. Regarding claims 24 and 26, Hikita et al. discloses its band elimination filter as a "receiving means" filter in a communication apparatus being a mobile radio (see col. 6, lines 43-50) that inherently has a plurality of filters including another filter as a transmitting means.

New Grounds of Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 25 and 30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hikita et al. U.S. 4,803,449 taken alone.

Hikita et al. discloses the invention as discussed above, except for specifically disclosing first and second inductor bonding wires between the first and second

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acoustic resonators and the first and second grounding points, respectively, or explicitly disclose the use of the filter in the mobile radio as being in an antenna duplexer.

The Examiner takes Official Notice that there are only two ways to mount SAW chips such as that of Hikita et al. Fig. 4, which are via bonding wires that provide an inherent inductance or via face down bump bonding and that it would have been extremely well known in the acoustic resonator filter and mobile radio communication (i.e. cellular phone) arts to use such filters in an antenna duplexer of the device (see other art of record as evidence, e.g., Sasaki et al., Beauden et al. and Yuda et al.)

Consequently, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the filter of Hikita et al., if even necessary, such that the filter would have been used in an antenna duplexer because such would have been an obvious intended use in the acoustic filter/communication arts and because Hikita et al. explicitly suggested its filter as a reception filter in a mobile radio device (see col. 6, lines 43-50), and it would have been further obvious to have mounted the filter with two wires providing two inherent inductors equivalent to the wires from P4 and P8 to ground in Hikita et al. Fig. 4, because Hikita et al. is silent as to the mounting method of the filter chip thereby suggesting to one of ordinary skill that any mounting method, such as wire-bonding, would have been usable therewith. Even if the filter were mounted by face down bump bonding, the substitution of wire bonding would have been an obvious art recognized alternative mounting means in the acoustic filter chip art.

Allowable Subject Matter

12. Claims 8, 11, 13-15 and 18-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

13. Applicant's arguments with respect to the claims and the prior applied art have been considered but are moot in view of the new ground(s) of rejection. All rejections in the prior Office action dated 11/3/04 have been withdrawn.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Saitou U.S. 6,346,859 discloses that it is known to provide only single stage band elimination filters rather than multiple stage filters (see Fig. 17 and col. 5, line 62 through col. 6, line 3).

Gopani et al. U.S. 5,077,545 discloses a band elimination (i.e. notch) filter using two SAW resonators (see Figs. 6, 9 and 10), but the two resonators are grounded to a common grounding point by one inductor, not to "first" and "second" grounding points. Additionally, Gopani et al. suggests replacing capacitors C2/33 (Fig. 5) in a notch filter with SAW resonators (see col. 6, lines 16-23).

Frank U.S. 6,879,224 discloses band elimination filters (see Figs. 3 and 4) using film bulk acoustic wave resonators (FBARs).

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15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs

June 29, 2005

(1 Attachment)



**BARBARA SUMMONS
PRIMARY EXAMINER**